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EXAMINER

SHECHTMAN, SEAN P

ART UNIT PAPER NUMBER

2125

DATE MAILED: 04/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/033,163

Applicant(s)

LANDERS ET AL.

Examiner

Sean P. Shechtman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,9,10,13-22,44,47-51,58,59,62-71,93,96-100,104-113,116,119-123 and 128-137 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Continuation of Disposition of Claims: Claims pending in the application are 1,2,9,10,13-22,44,47-51,58,59,62-71,93,96-100,104-113,116,119-123 and 128-137.

DETAILED ACTION

1. Claims 1, 2, 9, 10, 13-22, 44, 47-51, 58, 59, 62-71, 93, 96-100, 104-113, 116, 119-123, 128-137 are presented for examination. Claims 1, 2, 18, 50, 51, 67, 99, 100, 109, 122, 123, 133 have been amended.

Drawings

2. Objections withdrawn in light of the amendment filed January 27th 2006.

Specification

3. Objections withdrawn in light of the amendment filed January 27th 2006.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 9, 10, 13-22, 44, 47-51, 58, 59, 62-71, 93, 96-100, 104-113, 116, 119-123, 128-137 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims 1, 50, 99, and 122 require the limitation of virtual machining a manufacturing feature into a virtual blank, wherein the manufacturing feature exhibits an associative relationship with a coordinate system, wherein the virtual blank lacks an associative relationship with the coordinate system, wherein the virtual blank is included in a master process model that also lacks an associative relationship with the coordinate system. Since a manufacturing feature is machined into the virtual blank and the manufacturing feature exhibits an associative relationship with a coordinate system, the virtual blank and master process model would also, by

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association, have a relationship with the coordinate system. Therefore, it is not clear how the virtual blank and master process model lacks an associative relationship with the coordinate system.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1, 2, 9, 10, 13-22, 44, 47-51, 58, 59, 62-71, 93, 96-100, 104-113, 116, 119-123, 128-137 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Pat. No. 6,735,489 to Khurana.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Referring to claims 1, 50, 99, and 122, Khurana clearly teaches a method, system, part, and computer program of horizontally structured CAD/CAM manufacturing (Title; Abstract), comprising:

identifying a real-world blank for machining (Col. 6, lines 31-38; Col. 6, lines 11-12);
generating a virtual blank from a referenced set of geometries, the virtual blank corresponding to the real-world blank and lacking an associative relationship with a coordinate system (Col. 6, lines 31-37; Co. 2, lines 43-47; Col. 1, lines 23-28);

creating a master process model including the virtual blank generated from a referenced set of geometries (Col. 6, lines 11-46), said master process model lacking an associative relationship with a coordinate system (Col. 3, lines 59-65, Cols. 5-6 and the arguments presented below), said virtual blank corresponding to said real world blank (Col. 1, lines 37-39; Col. 6, lines 32-39);

virtual machining a manufacturing feature into said virtual blank, the manufacturing feature exhibiting an associative relationship with said coordinate system (Col. 8, lines 31-41; Fig. 5);

deriving manufacturing instructions from said master process model to create a real-world component by machining said manufacturing feature into the real-world blank (Abstract; Col. 1, lines 50-53; Col. 6, lines 23-31; Col. 8, lines 61-64).

Referring to claims 2, 9, 10, 13-22, 44, 47-49, 51, 58, 59, 62-71, 93, 96-98, 100, 104-113, 116, 119-121, 123, 128-137, Khurana teaches the above, wherein said associative relationship is a parent/child relationship; further comprising creating extracts from said master process model, wherein said extracts comprise replicated models of said master process model at various operations of said manufacturing instructions; wherein said virtual blank is positioned and oriented relative to said coordinate system; wherein said virtual blank is generated as a three dimensional parametric solid model from said reference set geometry; wherein said reference set geometry is defined by dimensional characteristics of a modeled part; wherein establishing said coordinate system comprises one or more datum planes; wherein said coordinate system comprises: a first datum plane positioned and oriented relative to a reference, a second datum plane positioned and oriented relative to said reference; and a third datum plane positioned and

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oriented relative to said reference; wherein said first datum plane, said second datum plane, and said third datum plane are orthogonal; generating machining instructions to create said actual part by machining manufacturing features into a blank and creating extracts from a master product and process model; wherein said extracts are used to generate manufacturing process sheets; wherein the master process model or process sheets links to numerically controlled machine tools and a coordinate measuring machine; and removing or establishing or substituting a link among a plurality of model elements (See figures 1-6; Col. 2, lines 7-65; Col. 8, lines 11-41; Col. 8, lines 50-67; Col. 9, line 1 – Col. 10, line 17).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1, 2, 9, 10, 13-22, 44, 47-51, 58, 59, 62-71, 93, 96-100, 104-113, 116, 119-123, 128-137 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 6,629,065 to Gadh (supplied by applicant) in view of U.S. Pat. No. 4,928,221 to Belkhiter.

Referring to claims 1, 50, 99, and 122, Gadh clearly teaches a method, system, part, and computer program of horizontally structured CAD/CAM manufacturing for concurrent product and process design (Fig. 55A and 55B; Col. 36, lines 28-39; Col. 8, lines 5-24), comprising:

identifying a real-world blank for machining (Figs. 10A-10C and corresponding description, i.e., “rubber-banding”);

generating a virtual blank from a referenced set of geometries, the virtual blank corresponding to the real-world blank and lacking an associative relationship with a coordinate system (In column 18, lines 1-10 and figures 5A-5C; In column 19, line 3- column 20, line 4);

creating a master process model including a virtual blank generated from a referenced set of geometries (Col. 10, lines 22-58; Fig. 55A, element b1), said master process model lacking an associative relationship with a coordinate system (Col. 24, lines 6-32), said virtual blank corresponding to said real world blank (Fig. 55A, element b1);

virtual machining a manufacturing feature into said virtual blank (Fig. 55A, any of elements nw or nb; See Fig. 55A and Col. 36, lines 28-39), the manufacturing feature exhibiting an associative relationship with said coordinate system (See Fig. 25A-25D; Col. 24, lines 6-32);

Referring to claims 2, 9, 10, 13-22, 44, 47-49, 51, 58, 59, 62-71, 93, 96-98, 100, 104-113, 116, 119-121, 123, 128-137, Gadh teaches the above, wherein said associative relationship is a parent/child relationship (Col. 24, lines 6-32; Col. 40, lines 14-57), further comprising creating extracts from said master product and process model, wherein said extracts comprise replicated models of said master product and process model at various operations of said manufacturing (Fig. 55C; Col. 10, line 54- Col. 11, line 7), Gadh teaches the above, wherein said virtual blank is positioned and oriented relative to said coordinate system, wherein said virtual blank is generated as a three dimensional parametric solid model from a reference set geometry, wherein said reference set geometry is defined by dimensional characteristics of a modeled part, wherein establishing said coordinate system comprises one or more datum planes, wherein said coordinate system comprises: creating a first datum plane positioned and oriented relative to a reference, creating a second datum plane positioned and oriented relative to said reference; and creating a third datum plane positioned and oriented relative to said reference, wherein said first datum plane, said second datum plane, and said third datum plane are orthogonal (Figs. 25A-D and 55A).

While Gadh clearly teaches creating a model and constructing a part in the VDSF, Gadh fails to provide for deriving manufacturing instructions from the master process model to create a real-world component by machining the manufacturing feature into the real-world blank.

While the instant claims call for horizontally structured CAD/CAM manufacturing, as presented by Gadh above, the instant specification appears to describe this horizontal structure with respect to the establishment of relationships that are taught as both horizontal and vertical (See page 4-5 and 9-10 of the instant specification). Therefore, even though the examiner interprets the claims to require at least a horizontally structured relationship in the preamble, the claims do not required any of the limitations in the body of the claims to have such a horizontal structure, exclusive, or non-exclusive CAD/CAM relationship. Namely, the claims do not require a horizontally structured CAD/CAM relationship with respect to generating machining instructions to create the actual part by machining the manufacturing feature into the blank.

Furthermore, the recitation “horizontally structured CAD/CAM manufacturing” has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). Clearly, the body of the claims do not depend on the preamble for completeness, in fact, applicant has admitted that the intended use of the horizontal structure is not limited by non-verticality (See pages 4-5 of the instant specification).

In view of the above, the examiner respectfully submits that patentability resides in the determination of non-obviousness with respect to deriving machining instructions from a model to create a real-world component by machining, in real life, the manufacturing feature into the real-world blank. The examiner respectfully submits that deriving machining instructions from a model to create a real-world component by machining, in real life, the manufacturing feature into the real-world blank, is commonly known in the art, and therefore, the examiner is unable to make said determination of non-obviousness at this time.

The examiner believes these limitations are clearly taught by Belkhiter.

Referring to claims 1, 50, 99, and 122, Belkhiter clearly teaches analogous art, wherein a conventional CAD/CAM system is used to produce a part drawing (Col. 2, lines 53-66 of '221) and then deriving machining instructions from the CAD/CAM system to create a real-world part by machining manufacturing features into a blank (See Cols. 7-8, table 2; Col. 1, lines 6-14; Col. 3 of '221;), and creating extracts from a master process model, wherein said extracts are used to generate manufacturing process sheets (Col. 14, lines 6-11 of '221).

Therefore, it would have been obvious to one of ordinary skill in the art at the time that the invention was made to combine the teachings of Belkhiter with the teachings of Gadh.

One of ordinary skill in the art would have been motivated to combine Belkhiter with Gadh because Belkhiter teaches a part program suitable for machining a part from a drawing without the need for human intervention. Furthermore, Belkhiter teaches a system that reduces lead-time between the request for a part and the machining of a part. Further still, Belkhiter teaches a system that reduces manpower costs (Col. 1, line 62 – Col. 2, line 2 of '221).

Double Patenting

7. Rejections withdrawn in light of the terminal disclaimer filed October 14th 2005.

Response to Arguments

Applicant's arguments filed January 27th 2006 have been fully considered but they are not persuasive.

8. Applicant argues that Khurana fails to teach generating a virtual blank from a referenced set of geometries. The examiner respectfully disagrees. Khurana clearly teaches selecting “a suitable blank, usually a die cast piece, and use the blank's measurements as the Base Feature 0 of the horizontal design method” (Col. 6, lines 31-37). The examiner respectfully submits that using the blank's measurements as the Base Feature is generating a virtual blank from a referenced set of geometries.

9. Applicant argues that Khurana fails to teach that the virtual blank lacks an associative relationship with a coordinate system. The examiner respectfully disagrees. Khurana clearly teaches that a change in features, such as a coordinate system (Co. 2, lines 43-47), is independent of the remaining features of a virtual part (Col. 1, lines 23-28). The examiner respectfully submits that a change in a coordinate system (Co. 2, lines 43-47) that is independent of the remaining features of a virtual part is a virtual blank that lacks an associative relationship with a coordinate system.

10. Applicant argues that Khurana fails to teach virtual machining a manufacturing feature into the virtual blank whereby the manufacturing feature exhibits an associative relationship with the coordinate system. The examiner respectfully disagrees. Khurana clearly teaches that for “any of these manufacturing processes, the Master Process Model can be used to represent the entire manufacturing process, from a blank to a finished component” (Col. 8, lines 30-41).

Khurana also teaches that once “a Base Feature has been established that precisely corresponds to a real-world blank, the next step is to build a horizontally-structured model in a manner that describes successive machining operations to be performed on the blank so as to produce the final real-world part. We will refer to this horizontally structured model as the Master Process Model 20” (Col. 6, lines 38-42), wherein Khurana teaches and claims creating the Master Process Model by adding one or more form features to the base feature (Col. 8, claim 1) and “establishing an associative relationship between each said form feature and said coordinate system” (Col. 9, lines 4-5). The examiner respectfully submits that the addition of form features to the base feature that describes successive machining operations to be performed on the blank so as to produce the final real-world part, wherein an associative relationship is established between each said form feature and said coordinate system is virtual machining a manufacturing feature into the virtual blank whereby the manufacturing feature exhibits an associative relationship with the coordinate system.

11. Applicant argues that Gadh fails to teach generating a virtual blank from a referenced set of geometries. The examiner respectfully disagrees. The examiner respectfully submits that Gadh teaches this limitation in any of the following ways:

In column 18, lines 1-10 and figures 5A-5C, Gadh clearly teaches and shows the addition and interactive geometric manipulation of an selected object primitive, such as a cylinder, to the 3D VE workspace. The examiner respectfully submits that the addition and interactive geometric manipulation of an selected object primitive, such as a cylinder, is generating a virtual blank from a referenced set of geometries.

In column 19, line 3- column 20, line 47, Gadh teaches creation of complex shapes by aggregating predefined shape elements, wherein a library of shape elements can be extended to include primitives having different shapes modeled as a collection of surfaces with vertex, edge and face, adjacency. Gadh also teaches VDSF allows modification of preexisting geometry and 3D rubber banding. The examiner respectfully submits that creation of complex shapes by aggregating predefined shape elements and/or modification of preexisting geometry and 3D rubber banding is generating a virtual blank from a referenced set of geometries. See figures 10A-10C.

12. Applicant argues that Gadh fails to teach virtual machining a manufacturing feature into the virtual blank. The examiner respectfully disagrees.

Gadh clearly teaches exemplary embodiments of a “machined part constructed in VDSF” (See Col. 35, lines 61-63; Col. 36, lines 15-44). VDSF is the Virtual Design Software Framework. The examiner respectfully submits that a machined or injection-molded part constructed in VDSF is virtual machining of a virtual blank.

Gadh clearly repeatedly provides manufacturing features that are virtually machined (See Figs. 52A-56B; and the entire disclosure of Gadh document). For example, Gadh clearly teaches the intersection of one element into another (Col. 36, lines 33-34). Furthermore, Gadh teaches that the operating characteristics of the VDSF allows the designer to create “a shape by adding elements (positive or negative) via the “Add On” Operation”, wherein the constraints of this operation prevents the generation of an invalid model (Col. 36, lines 63-67). In column 19 and figures 6-10 Gadh clearly teaches these “Add On”(s), such as Add On boss, Add On rib, Add On rectangular slots, pockets, holes, etc, etc.

13. Applicant argues that Gadh fails to teach the manufacturing feature exhibits an associative relationship with the coordinate system. The examiner respectfully disagrees. Examiner respectfully submits that “associative relationship” requires no further explanation and that it will be given its plain meaning as required by MPEP 2111.01. Webster's Dictionary defines associative as “of, or relating to, in association with” while relationship as “a state or character of being related... a natural or logical association between two or more things, connection.” The examiner respectfully submits that Gadh teaches this limitation any of the following ways:

In column 24, lines 6-32, Gadh clearly teaches alignment of elements in the X and Y axes. In mathematics, the X and Y axes are known as a Cartesian coordinate system. Figure 25 shows X, Y, and Z axes, and even draws the three-dimensional coordinate system. The examiner respectfully submits that anything aligned with a coordinate system shares an associative relationship with the coordinate system.

Referring to the figures 55A-5B of Gadh, the virtual blank is element b1, and a manufacturing feature could clearly be any of nw or nb with exclusive relationships to b1. Gadh clearly teaches elements as add-ins, wherein, as mentioned above, the figures depict “a machined part constructed in VDSF”. Figures 55A-5B of Gadh clearly shows the manufacturing features on *a grid coordinate system*. The examiner respectfully submits that the features on a grid coordinate system a features that share an associative relationship with the coordinate system. Furthermore, Gadh clearly teaches a child element (which can clearly be interpreted, as any of the nw or nb elements) has an associative relationship with the coordinate system in column 24, wherein Gadh teaches the VDSF display viewed by the user is considered as having *a right-*

left/top-bottom/front-rear coordinate system, whereby the user issues intuitive commands for a user-viewpoint-dependent method of alignment of said child element. And, Gadh also clearly teaches that VDSF determines the XYZ coordinate axes when a viewpoint-dependent alignment command is issued (Col. 24, lines 6-32). The examiner respectfully submits that anything aligned with a coordinate system shares an associative relationship with the coordinate system.

14. Applicant argues that Gadh fails to teach that the virtual blank lacks an associative relationship with a coordinate system. The examiner respectfully disagrees. The examiner respectfully submits that Gadh reads on this limitation in anyone of the following ways:

a) Gadh clearly teaches at least two coordinate systems. One from the user viewpoint and the others that are XYZ coordinate systems fixed on the model. Once a user viewpoint command is issued to align a child element the VDSF determines which of the XYZ coordinate axes fixed on the model most closely corresponds to the left-right axis (from the user viewpoint) and the child element is aligned on the model along that axis of the model (the XYZ axis) (See col. 24, lines 6-32). If the model were not lacking an associative relationship with the user viewpoint there would be nothing for VDSF to determine. It is because the model is lacking an associative relationship with the user viewpoint that the VDSF must make the determination of which XYZ axis to use in alignment.

b) Figs. 25A-25D of Gadh show and Col. 24, lines 6-14 teaches b1 has a coordinate system and b2 has a coordinate system, wherein b1 and b1's coordinate system lack an associative relationship with the coordinate system of b2, i.e., it is clear that one of ordinary skill in the art would not use the coordinate system of b2 to align an element to b1.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean P. Shechtman whose telephone number is (571) 272-3754. The examiner can normally be reached on 9:30am-6:00pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo P. Picard can be reached on (571) 272-3749. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SPS

Sean P. Shechtman

April 12, 2006

Albert W. Paladini 4-14-06
ALBERT W. PALADINI
PRIMARY EXAMINER